

*Corvette*  
**PLASTIC BODY**

**REPAIR  
AND  
REFINISHING**

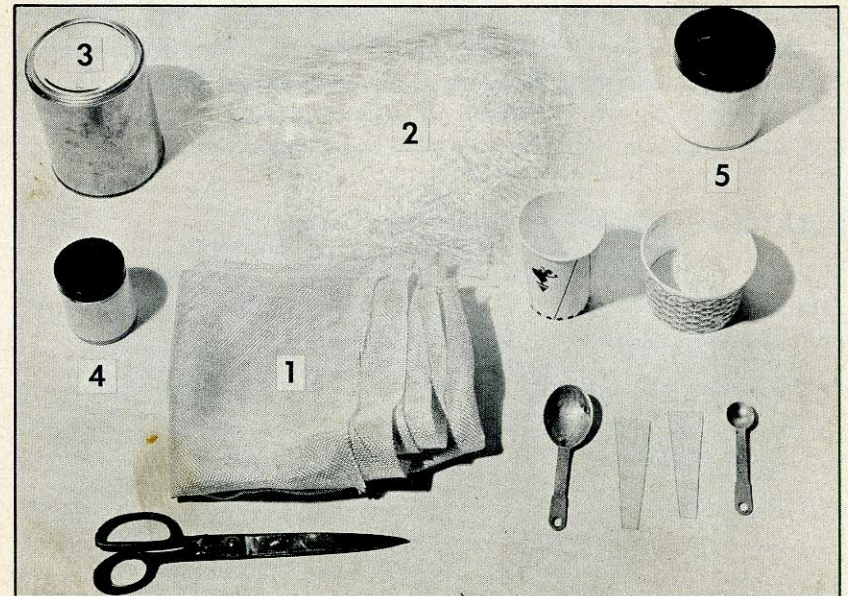


**CHEVROLET MOTOR DIVISION  
GENERAL MOTORS CORPORATION  
DETROIT, MICHIGAN**

# CORVETTE BODY REPAIR AND PAINT REFINISHING

The Corvette plastic body presents, at first glance, numerous problems involving panel repairs and refinishing. Being a new product, the serviceman might be apprehensive about the panel repair or refinishing procedure on the Corvette. Actually, the panel repair procedures are simple and the paint refinishing procedure is the same as recommended for metal bodies.

Basically, the Corvette body is formed from laminated sheets of fibre glass mats held together with a Polyester resin, (liquid plastic). When the liquid resin cures or hardens, it binds the filaments of glass in the mats to create a solid panel. The strength of the panel is provided by the fibre glass and the liquid plastic only acts as the bond, supplying very little additional strength to the panel.



**Figure 1**

- 1. Glass Fibre Cloth
- 2. Chopped Glass Fibre
- 3. Resin (liquid plastic)
- 4. Catalyst (hardener paste)
- 5. Thickener

In general, all repairs to the Corvette body consist of filling the damaged area with some type of glass and resin. The plastic is then allowed to harden and then the finish operations are performed. Use of the various forms of glass is determined by the type of repair to be made.

Two plastic body repair kits are available, containing all the necessary ingredients for panel repair. One kit, Figure 1, includes woven glass fibre cloth (1), chopped glass fibre (2). The other kit includes resin (liquid plastic) (3), catalyst (hardener paste) (4), thickener (5); in addition, paper cups (unwaxed type) two measuring spoons (tablespoon and a  $\frac{1}{4}$  teaspoon) and scissors are required. The storage of the resin and catalyst presents a problem. The shelf life of these items is limited and may be as short as three months in very warm weather. Under refrigeration, they are usable indefinitely. Over-age is indicated by "gelled" or hardened resin.

Repair procedures will be discussed in this manual covering all the anticipated field problems involving plastic panels. Since the repair procedures are new, undoubtedly, there will be future revisions of this writing. The following eight individual problems are covered in this manual: Scratched Panels, Dents or Pits in Panels, Cracked Panels, Holes in Panels, Fractured Panels, Cracks at Panel Junction, Panel Replacement and Paint Refinishing. Refer to figure 29 which illustrates various types of abrasive materials available for plastic repair operations.

### SCRATCHED PANELS

In most instances, a scratched panel will involve only a paint refinishing job. Figure 2 shows the top of a fender panel which has been scratched through to the plastic.

1. Remove all paint down to the plastic from the area surrounding the scratch with Lacquer Removing Solvent, Dupont number 39012, or some similar solvent.
2. Featheredge the repair area with No. 220 wet or dry sandpaper and finish block sand with No. 320 wet or dry paper (fig. 3).

**CAUTION:** *Do not sand too deeply into fibre glass mat. Should it be necessary to cut fairly deep into the glass mat use the repair procedure suggested for dents and pits in plastic panels.*

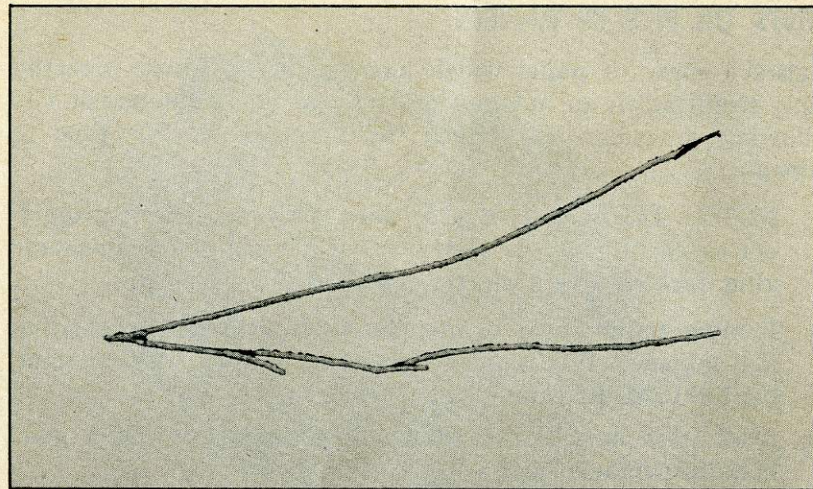


Figure 2

3. Clean up repair area with Prep-Sol, then finish the clean-up with a tack rag.
4. Protect surrounding panels by masking before performing paint refinishing operations. Use only non-staining type masking tapes on Corvette plastic body.
5. Refinish panel as described in paint refinishing portion of this manual.

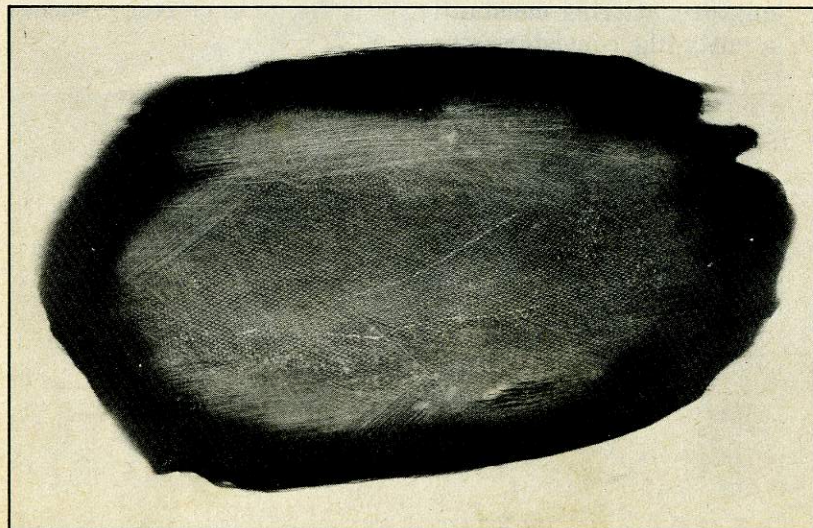


Figure 3

## DENTS OR PITS IN PANELS

Figure 4 shows a panel which has received a heavy glancing blow, resulting in an indentation or large pit in the panel. The following procedure is advised for a repair on this type of damage.

*NOTE: This repair may be used wherever the damage is not extensive and the plastic is not pierced, but the damage area does require a plastic build-up.*

1. Remove paint down to the plastic from area surrounding the damage with Lacquer Removing Solvent, Dupont number 39012, or its equivalent.
2. Scuff area surrounding damaged area to provide a good bonding surface (fig. 5).
3. Clean up work area with Prep-Sol then use tack rag for finish clean-up.
4. Prepare resin (gel coat) according to mixing chart on page 29 in the following manner for filling in dents or pits. Place the resin in an un-waxed cup and mix the desired amount of catalyst. The complete mixing operations should be performed with a reasonable amount of speed as a high concentration of catalyst in a small volume of resin will immediately start the hardening reaction.
5. Depending on location of dent or pit, mix thickener into mixture, stirring constantly until the mass or resin reaches a putty-like consistency.

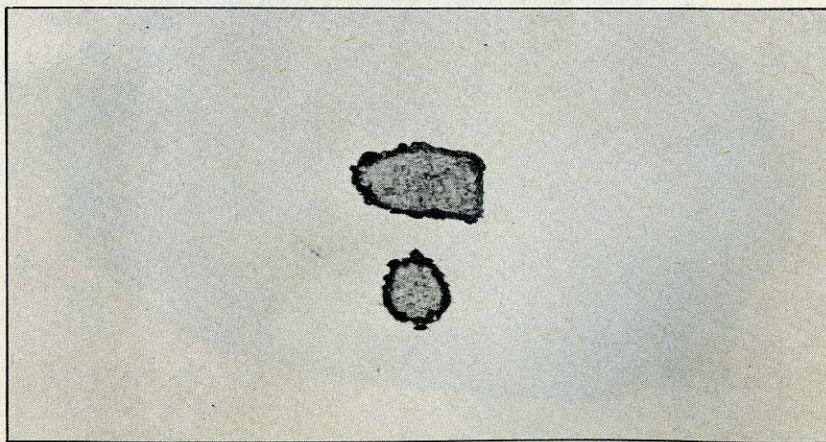


Figure 4

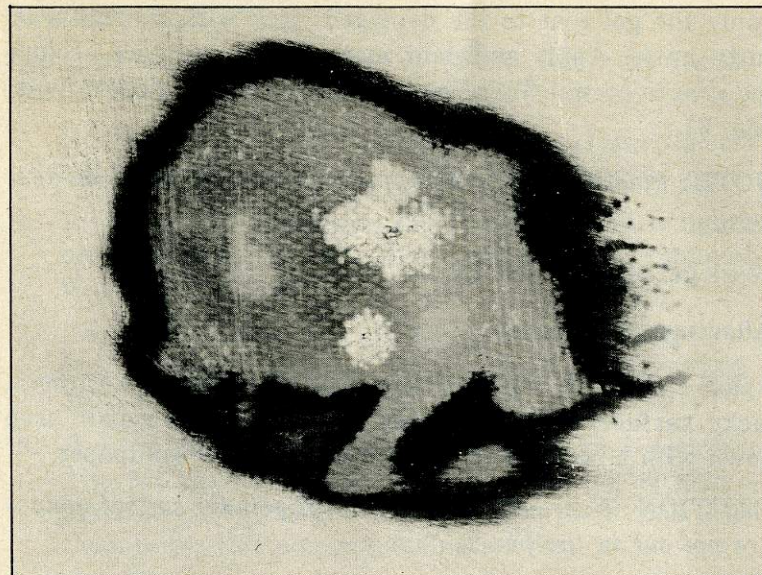


Figure 5

*NOTE: Thickener is not necessary unless dent or pit is on a curved or vertical panel where gel coat would have a tendency to run*

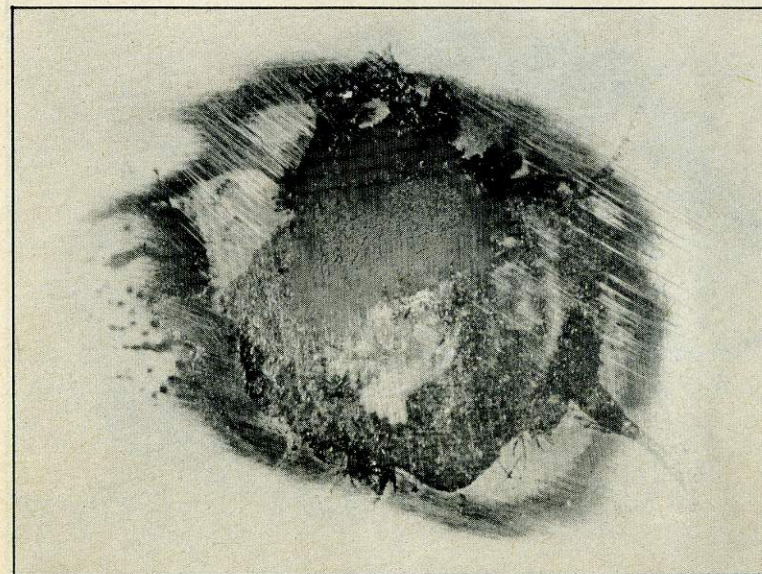


Figure 6

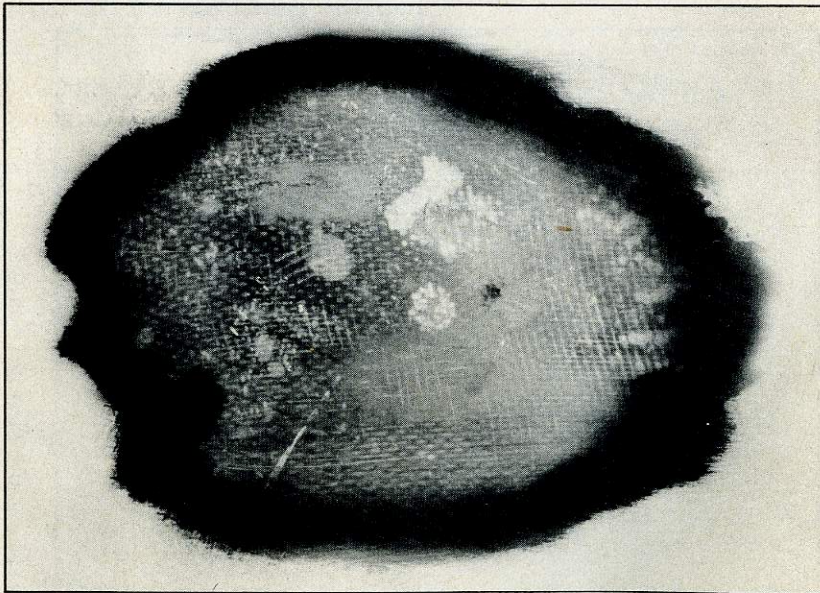
6. Apply the gel coat to the damaged area with a spatula or putty knife. Apply sufficient material for build-up around the area to permit filing or grinding and sanding operations, (fig. 6).

*NOTE: Plastic will shrink approximately 8% upon hardening.*

7. Work gel coat out smoothly.
8. Allow repair to harden.
9. After hardening, surface may still be tacky. Cut through tacky surface with sandpaper and then dress repair area down with a body file or grinder or No. 80-D sandpaper.

*CAUTION: Exercise care with file or grinder so that gouges are not cut in the panel.*

10. Feather sand damaged area with No. 220 sandpaper and finish sand with No. 320, (fig. 7).
11. Prepare repair area for paint refinishing operation (see paint refinishing operation in this manual).



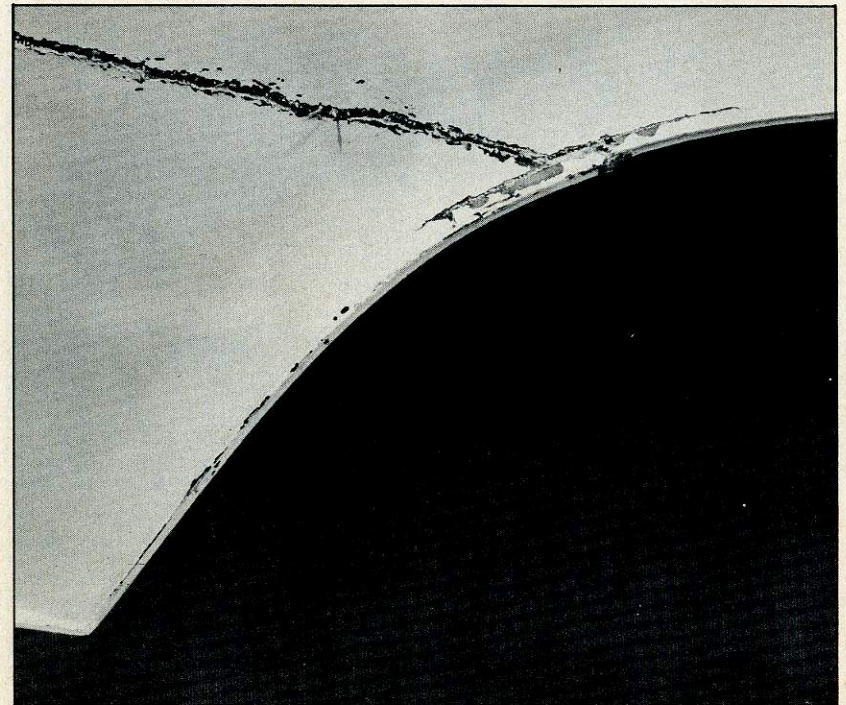
**Figure 7**

## **CRACKED PANELS**

Where a fender panel, (fig. 8) or the like, has fractured or broken off, the following repair operations are recommended.

*NOTE: For best results, ambient temperature should be at least 70°-75° F.*

1. In the case of a cracked panel, such as shown in figure 8, cut along the break line with a hacksaw blade and remove broken portion of the panel.
2. Remove the paint down to the plastic from both portions of the panel with Dupont Lacquer Remover No. 39012 or its equivalent.
3. Remove dirt and deadener thoroughly, back approximately 2 to 3 inches from the fracture, on the under side of both portions of the panel. Also, remove paint and scuff area clean to provide a good bonding surface.
4. Remove all cracked and fractured material along the break. Bevel the attaching edges of the panels at approximately a



**Figure 8**

30° angle with a file or grinder and scuff plastic surfaces along edges of break.

NOTE: Mask surrounding panels using a non-staining masking tape.

5. Use "C" clamps to align panel portions allowing approximately  $\frac{1}{8}$ " between the panels or as necessary to provide proper alignment of panels (fig. 9).
6. With scissors, cut two pieces of woven glass fibre cloth for backup and of sufficient size to overlap the fracture by approximately two inches.
7. Clean up repair area with Prep-Sol, then use tack rag for finish cleanup.
8. In an un-waxed paper cup, catalyze a quantity of resin sufficient to impregnate the pieces of woven glass fibre, (see mixing chart on page 29).
9. Impregnate glass cloth with the plastic mixture either by dipping or by brushing. Squeeze excess resin out of glass cloth.

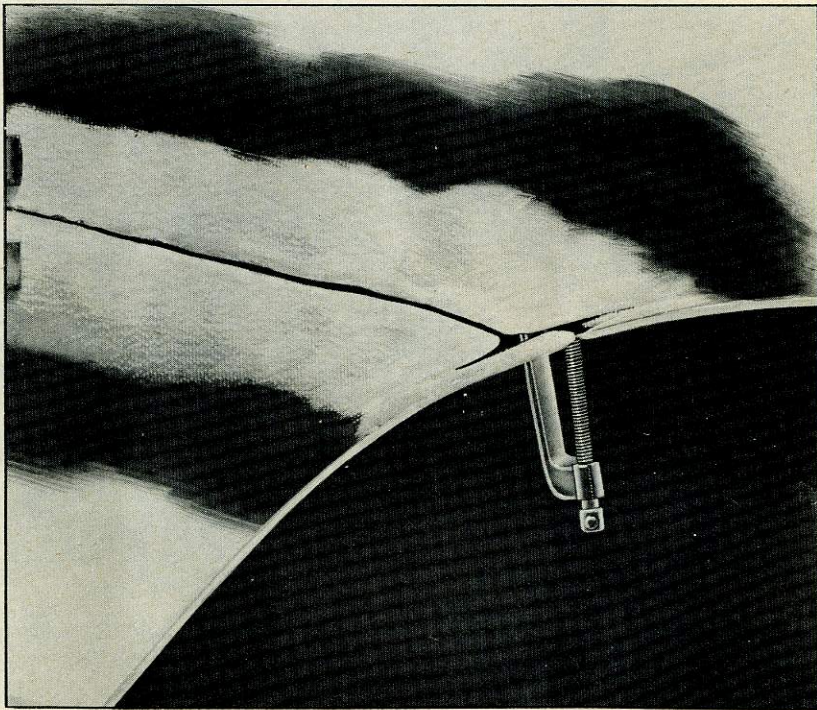


Figure 9

NOTE: The strength of the patch is directly proportional to the glass content and care should be taken to avoid over-rich plastic areas.

10. Apply two glass cloth backup plies to underside of the break (fig. 10).
11. Center backup glass plies over the fracture and eliminate any entrapped air by "squeegeeing" from the center toward the edges with a plastic spatula.  
  
NOTE: It may be necessary to support the backup patch with paper or other material so the backup plies will conform to contour of the panel. This support may be removed after the plastic has gelled.
12. Prepare a second batch of catalyzed resin as previously described. To this mixture add chopped glass fibre cut in  $\frac{1}{2}$ " lengths until resin mass has a putty-like consistency.
13. Apply resin mixture liberally to exterior of body in and around panel junction line (fig. 11). Build up area sufficiently with plastic to allow for filing and sanding operations. Plastic will shrink approximately 8% upon hardening.

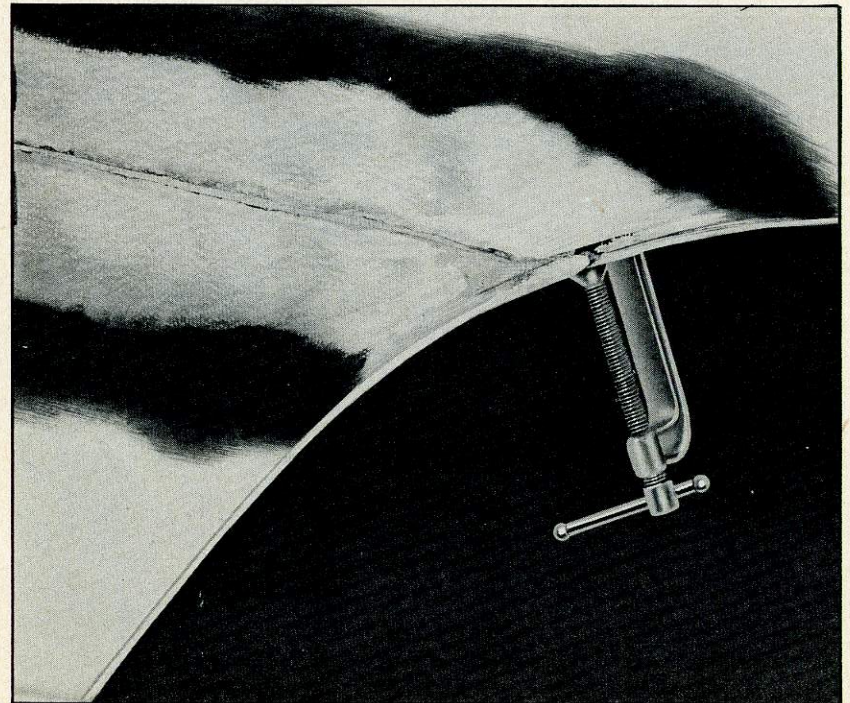


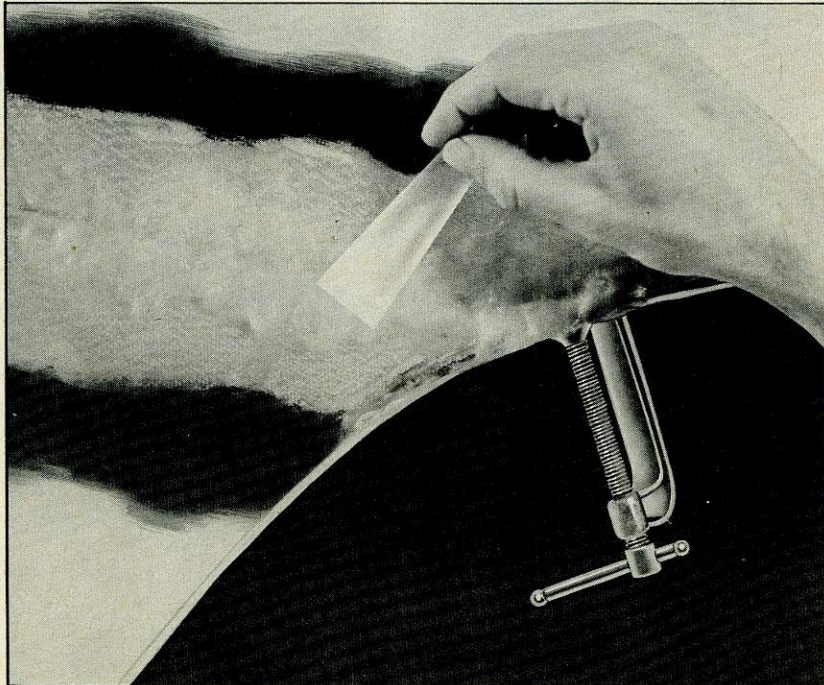
Figure 10

*NOTE: In some cases it may be desirable to provide additional reinforcements along a fracture. This may be accomplished by placing glass cloth strips in the panel break before applying the plastic mixture.*

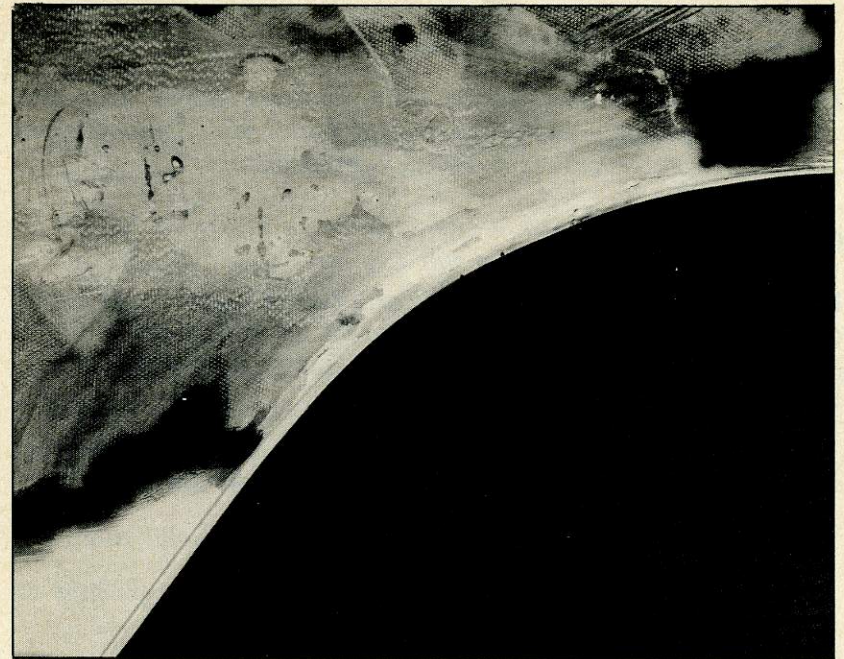
14. Allow plastic patch to harden.

*NOTE: The curing may be sped up by the use of infra-red heat lamps, but care should be exercised. If the plastic mixture becomes too warm, the resin has a tendency to run, also it will discolor and the structural strength will be impaired.*

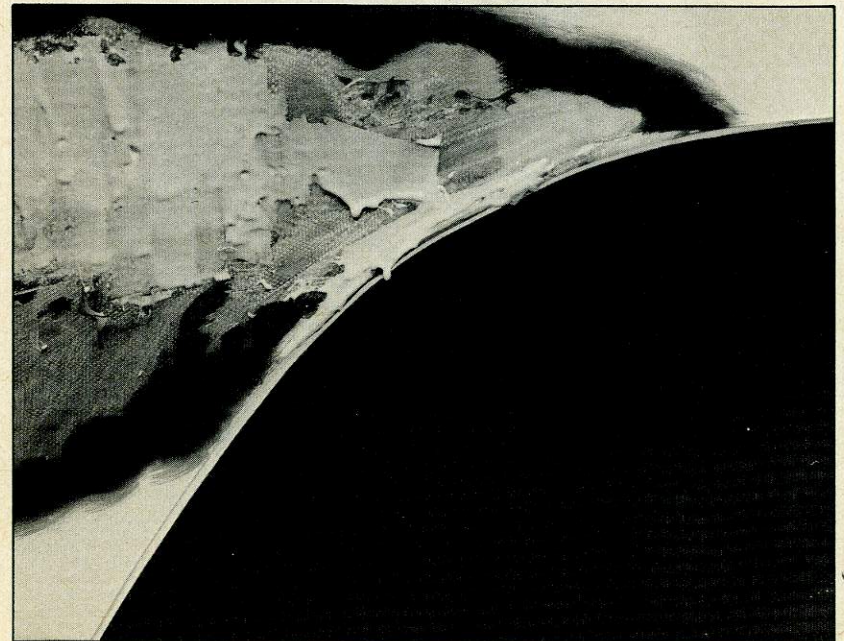
15. After the patch has hardened the surface may still be tacky. Cut through tacky surface with sandpaper and then grind, file or sand until the patch matches the overall panel contour (fig. 12).
16. Break plastic skin over all air pockets and fill pits with a plastic mixture composed of resin, catalyst and thickener mixed to give a putty-like plastic mixture (fig. 13).
17. Allow plastic to harden, then file or sand plastic to match body contour.



**Figure 11**



**Figure 12**



**Figure 13**

18. Feather sand with #220 and #320 wet or dry sandpaper preparatory to paint refinishing.
19. Mask surrounding panels with masking paper and non-staining tape. Finish clean-up of panel with Prep-Sol and tack rag. (See paint refinishing operation.)

### HOLES IN PANELS

Figure 14 shows a hole in the side of a fender panel. This type of damage will be rare in the field, due to the unusual strength of the plastic panel. The following procedure may also be applied to a fractured area.

1. Prepare the damaged area by grinding or filing all cracked and splintered material away from around the hole.
2. Bevel the edge of the hole at approximately a 30° angle.
3. Remove the paint with Dupont Lacquer Solvent #39012 or its equivalent, (fig. 15).

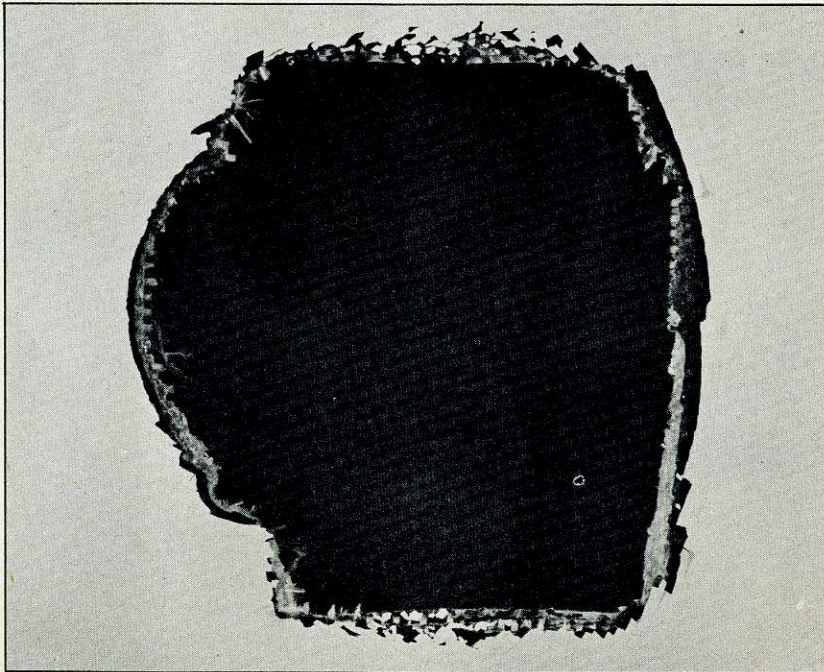


Figure 14

4. Thoroughly remove dirt, paint, and deadener from underside of panel for a distance of approximately 4" from the break.
5. Scuff plastic surface on both sides of panel with #80-D sandpaper.
6. Clean up work area with Prep-Sol and wipe dry and mask surrounding panels using a non-staining masking tape.
7. Cut two pieces of glass cloth, which will overlap the hole. These pieces of cloth will be used for the backup lamination.

*NOTE: If the plastic section is rather thick, tailor a suitable number of pieces of glass cloth to the approximate shape of the hole.*

8. The size of the area will determine the amount of resin needed for backup and insert laminations (if used). Catalyze a sufficient amount of resin in an un-waxed paper cup, according to chart on page 29.

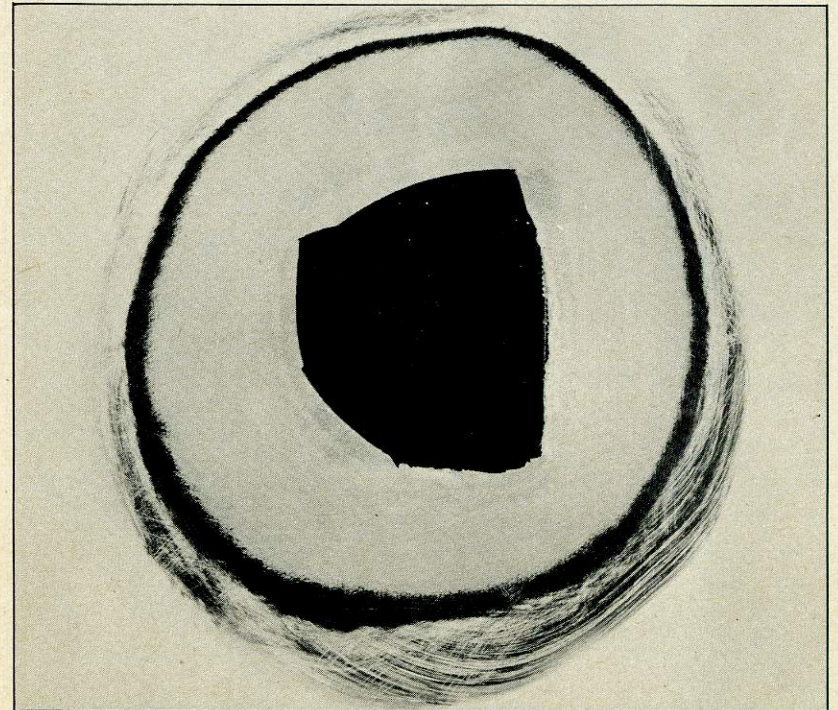


Figure 15



9. Impregnate glass cloth with the plastic mixture. Squeeze the excess plastic out of the cloth.
10. Apply the two backup laminations to the underside of the panel (fig. 16).
11. Eliminate all entrapped air and excess resin by "squeegeeing" from the center to the outer edges of the patch.  
*NOTE: It may be necessary to support the backup plies with paper or some other material to make the backup conform to the panel contour.*
12. If buildup plies are to be used in the hole, apply resin impregnated woven glass plies inside of the hole. Slightly overlap the bevel at the edge of the hole.
13. While waiting for resin to gel, prepare a second batch of catalyzed resin to be used for fill and buildup.
14. To this thoroughly mixed plastic mixture, add chopped glass ( $\frac{1}{2}$ " length) in a sufficient quantity, to give the mixture a putty-like texture.

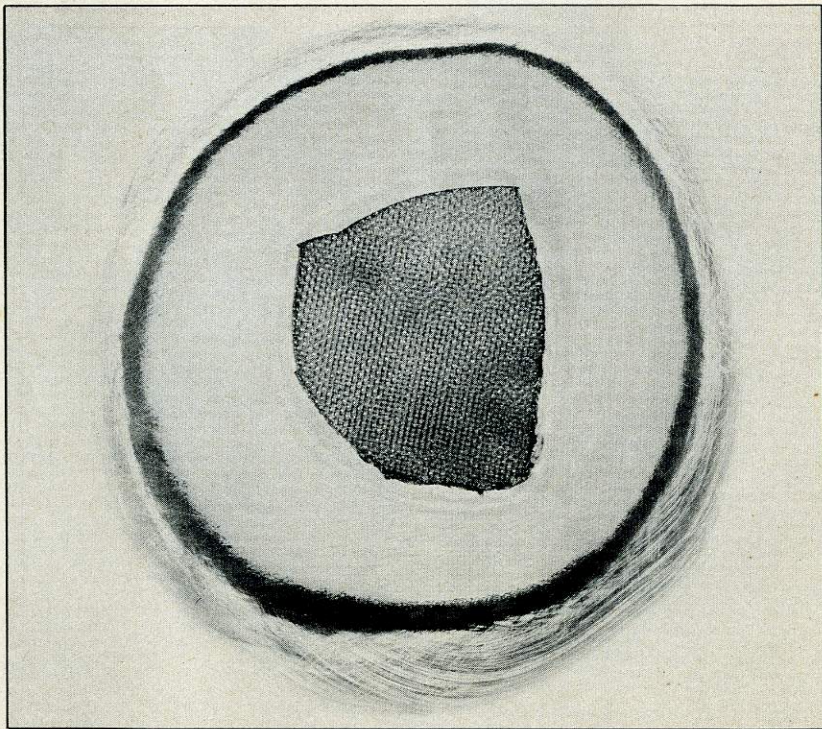


Figure 16

15. Liberally apply plastic mixture with a spatula to the exterior of the body in and around the hole. Build up the area sufficiently to allow a surplus of plastic for finishing operations of grinding, filing and sanding (fig. 17).

*NOTE: Plastic will shrink approximately 8% upon hardening.*

16. After patch has hardened, file, grind, or sand patch to match surrounding panel contour. Use 80-D sandpaper and finish sanding with #220 wet or dry sandpaper (fig. 18).

*NOTE: If patch is slightly tacky on the surface, knock this surface off with sandpaper. When filing or grinding, exercise care to avoid gouging plastic or grinding too deep into the fibre glass cloth mats.*

17. Remove plastic skin from all air holes and fill holes with a plastic mixture of resin, catalyst and sufficient thickener to give a putty-like body to the mixture (fig. 19).

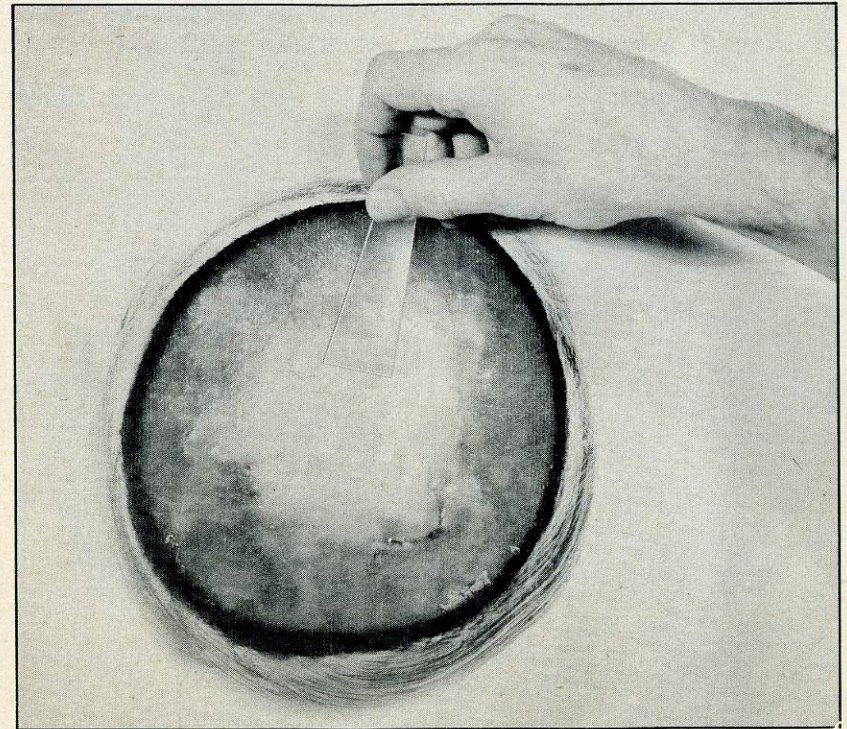


Figure 17

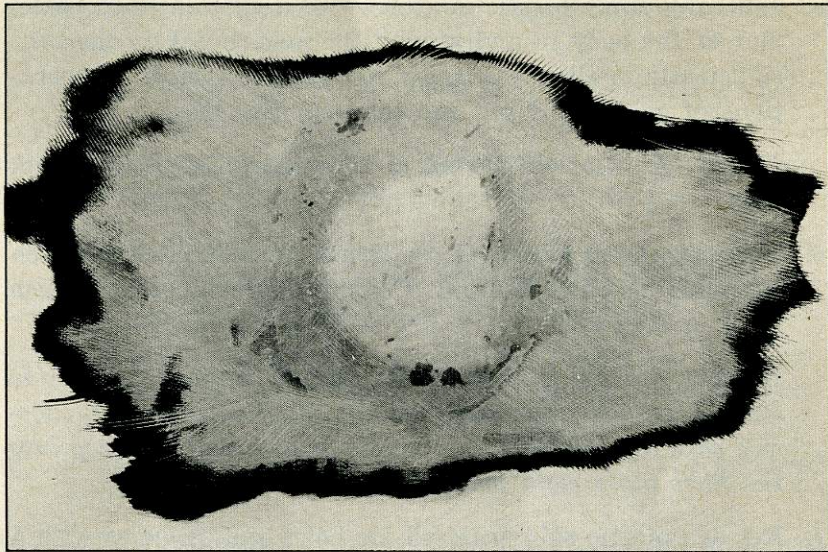


Figure 18

18. Block sand the plastic fill with 80-D sandpaper and finish sanding with #220 and #320 wet or dry sandpaper.
19. Prepare repair for paint refinishing (see paint refinishing operations).

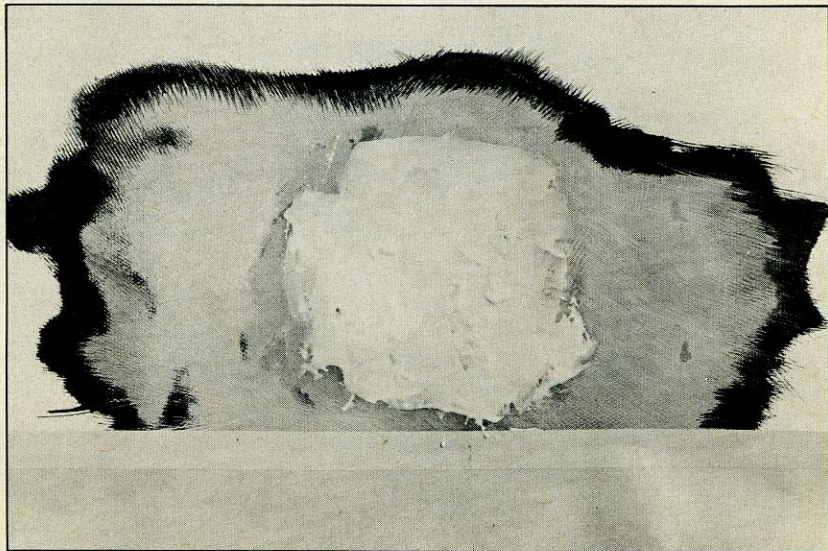


Figure 19

## FRACTURED PANELS

Occasionally, some damage will occur to panels where the underside is inaccessible or for reasons of panel contour it is impractical to use back plies of fibre glass cloth. While the front section of the fender (fig. 20) is not inaccessible, the exterior method of application was used as an example. The following repair operations are typical of this type of damage.

1. Prepare the damaged area by grinding or filing all cracked and splintered material away from the fracture.
2. Bevel the edge of the fracture at approximately a 30° angle (fig. 21).
3. Remove paint from area surrounding fracture with Dupont Lacquer Solvent, #39012 or its equivalent.
4. Scuff surface to provide a good bonding surface. Then, clean up area with Prep-Sol and wipe dry.

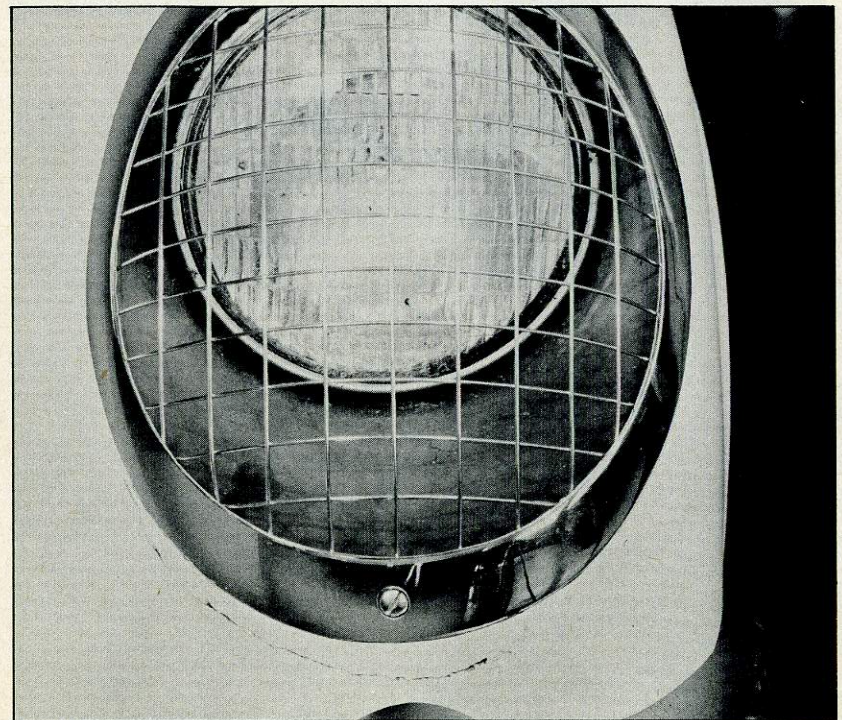


Figure 20

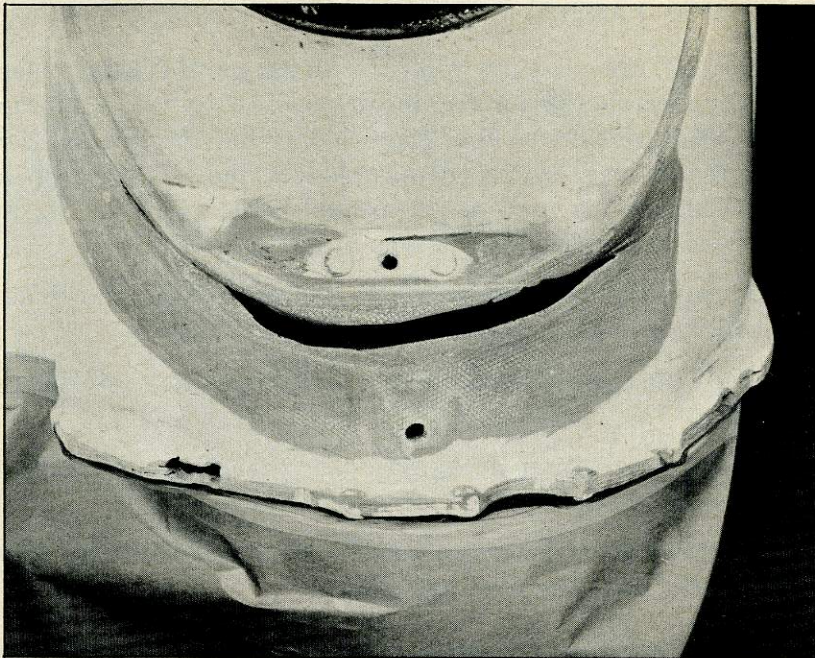


Figure 21

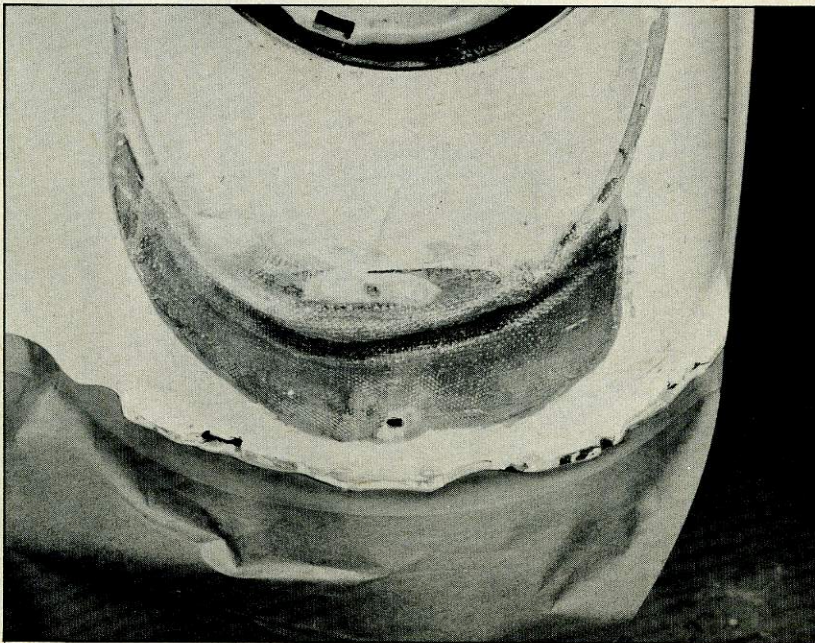


Figure 22

5. Protect adjacent panels by masking, use non-staining masking tape.
  6. Cut a strip of fibre glass cloth of sufficient size, so the fracture will be lapped from 1 to 2 inches on all sides.
  7. Prepare plastic mixture in an un-waxed paper cup. (See mixing chart on page 29.)
  8. Impregnate glass fibre cloth by brushing or dipping in plastic mixture. Squeeze excess mixture from cloth.
- NOTE: Avoid over-rich plastic areas in the glass cloth, as the strength of the patch is directly proportional to the glass content of the patch.*
9. Position plastic impregnated fibre glass over the fracture on the exterior of the panel, lap the break by 1 to 2 inches (fig. 22), and depress into fracture.
  10. Carefully work excess plastic out of woven glass by "squeezing" from the center of the break outward.

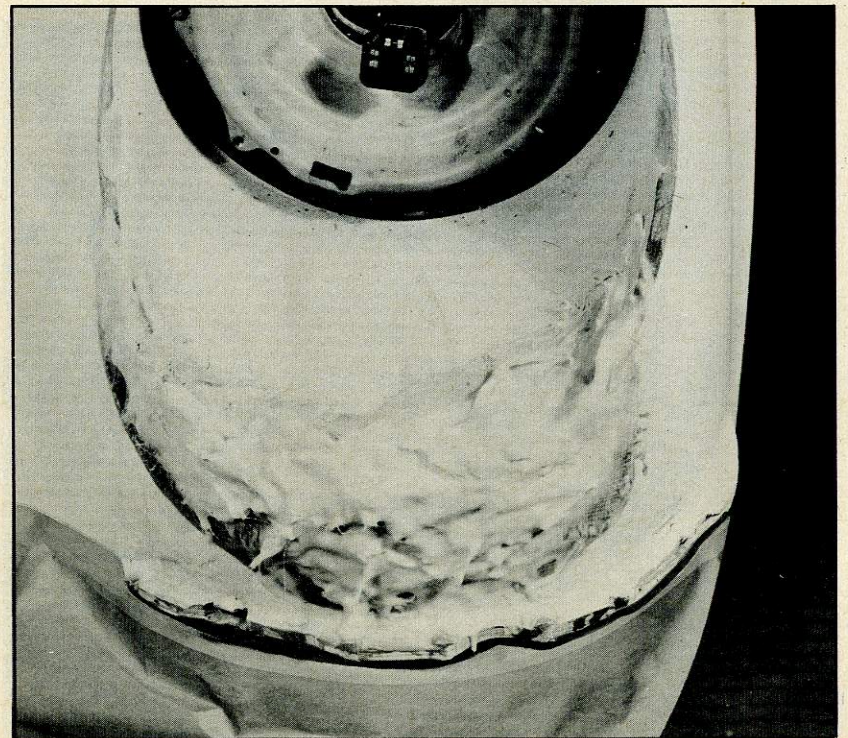


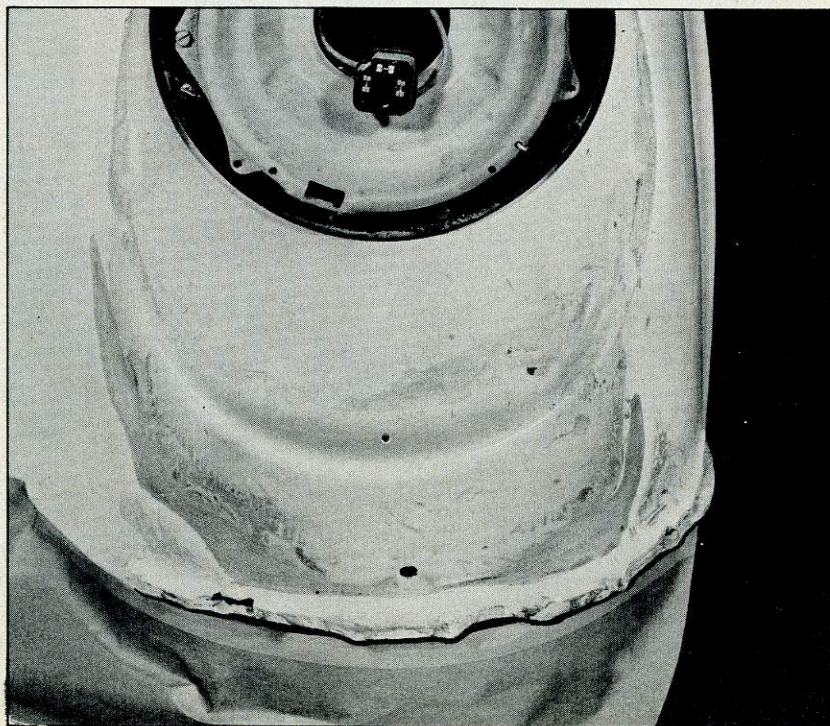
Figure 23

*NOTE: Hold woven glass in place until plastic resin "gels" with paper or some similar material.*

11. Trim excess or loose strands of fibre glass from patch.
12. Prepare another plastic mixture of resin and catalyst and mix thoroughly. To this mixture add chopped 1/2" glass to give the mixture a putty-like consistency.
13. Liberally apply the plastic mixture with a spatula to fracture and surrounding area, deposit enough material build-up to allow for filing and sanding operations (fig. 23).

*NOTE: Plastic will shrink approximately 8% upon hardening.*

14. Allow the patch to harden.
15. After hardening, knock the tacky outer surface of the patch off with sandpaper.
16. File or grind patch to match the general contour of the panel (fig. 24). Exercise care when performing these operations to avoid gouging the patch or surrounding panel.



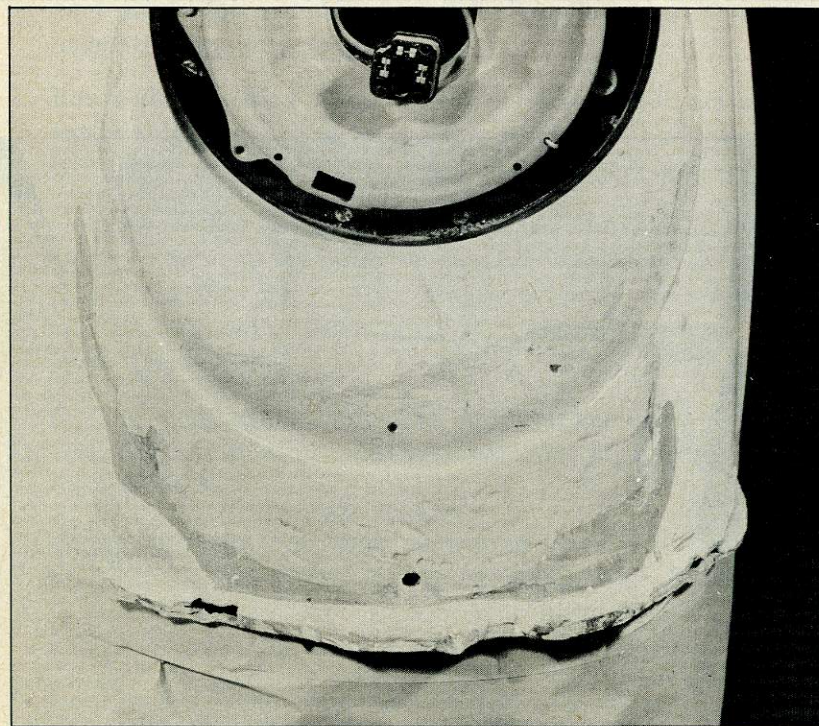
**Figure 24**

17. Remove plastic skin from all air pockets in the patch and fill holes with plastic mixture of resin, catalyst and thickener mixed to give a putty-like body (fig. 25).
18. Allow fill to harden, then sand finish preparatory to paint operation, (see paint refinishing section).

### **CRACKED AT PANEL JUNCTION**

Figure 26 shows a crack at the junction of two panels. This type of repair requires a minimum of time and effort.

1. Cut all splintered material from break and sand area to provide a good bonding strip.
2. Prepare a mixture of plastic composed of resin, catalyst, and chopped 1/2" glass fibres to make a putty-like mixture.
3. Fill crack with plastic mixture and allow patch to harden (fig. 27).
4. Sand area to surrounding panel contour.
5. Prepare surface for paint. (See paint refinishing in this manual.)



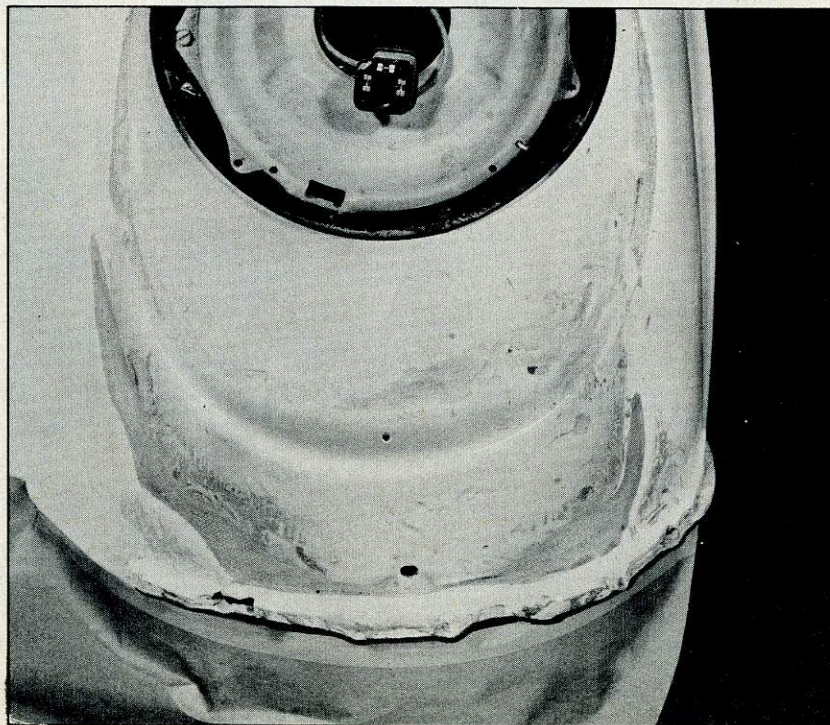
**Figure 25**

*NOTE: Hold woven glass in place until plastic resin "gels" with paper or some similar material.*

11. Trim excess or loose strands of fibre glass from patch.
12. Prepare another plastic mixture of resin and catalyst and mix thoroughly. To this mixture add chopped  $\frac{1}{2}$ " glass to give the mixture a putty-like consistency.
13. Liberally apply the plastic mixture with a spatula to fracture and surrounding area, deposit enough material build-up to allow for filing and sanding operations (fig. 23).

*NOTE: Plastic will shrink approximately 8% upon hardening.*

14. Allow the patch to harden.
15. After hardening, knock the tacky outer surface of the patch off with sandpaper.
16. File or grind patch to match the general contour of the panel (fig. 24). Exercise care when performing these operations to avoid gouging the patch or surrounding panel.



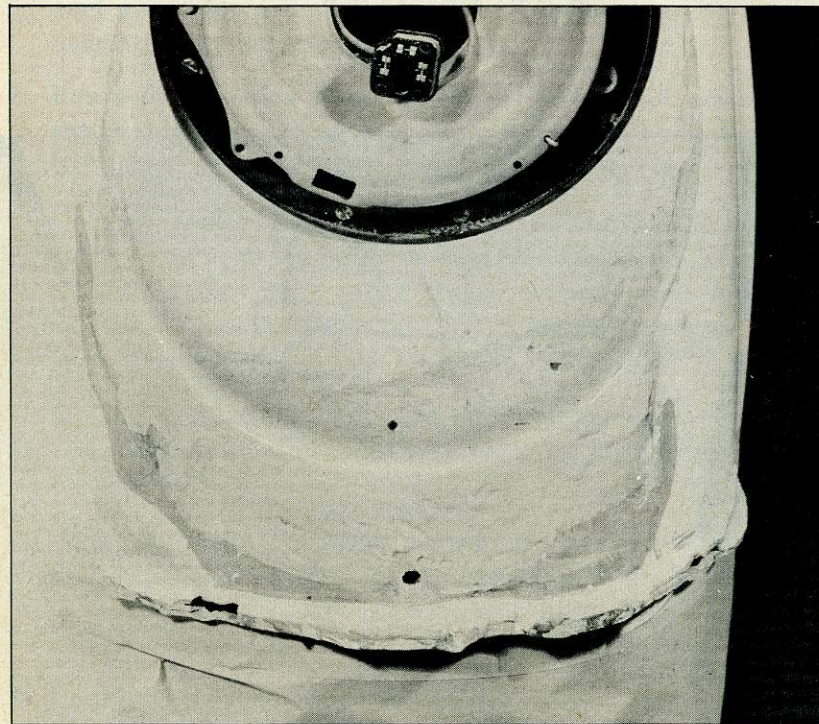
**Figure 24**

17. Remove plastic skin from all air pockets in the patch and fill holes with plastic mixture of resin, catalyst and thickener mixed to give a putty-like body (fig. 25).
18. Allow fill to harden, then sand finish preparatory to paint operation, (see paint refinishing section).

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3. Fill crack with plastic mixture and allow patch to harden (fig. 27).
4. Sand area to surrounding panel contour.
5. Prepare surface for paint. (See paint refinishing in this manual.)



**Figure 25**

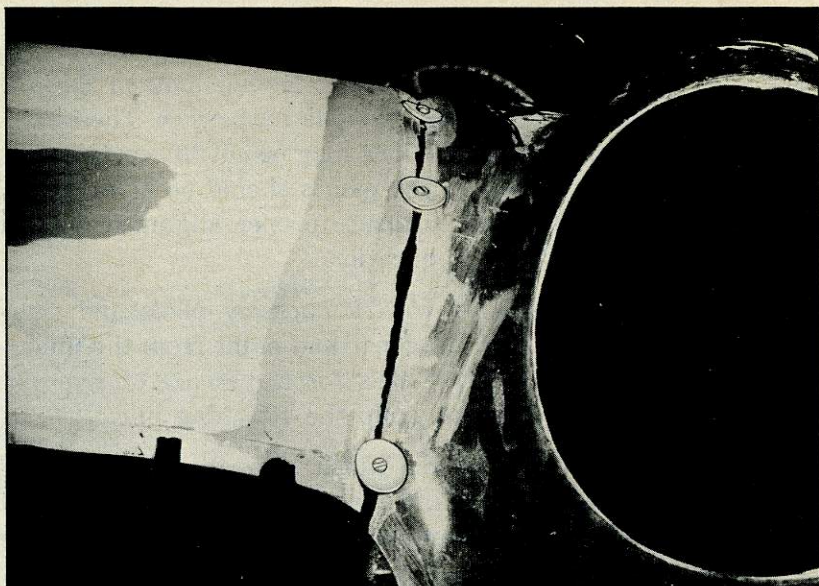


Figure 28

9. Place impregnated backup plies on underside of panels. If necessary, hold back-up plies in place with paper until plastic "gels."
10. Prepare another plastic mixture of resin and catalyst (see mixing chart on page 29) and mix thoroughly. To this mixture add chopped glass fibre ( $\frac{1}{2}$ " lengths) until mixture has a putty-like consistency.
11. Fill "V" groove with reinforced plastic material. Build up surrounding area with sufficient material to allow for shrinkage (approximately 8%) and finish operations.
12. Allow patch to harden.
13. File or sand (#80-D sandpaper) to general panel contour.
14. Remove plastic skin from all air pockets and fill pockets with plastic mixture of resin, catalyst and sufficient thickener to give a putty-like body.
15. Allow plastic fill to harden, then sand, preparatory to paint operations. (See paint refinishing in this manual.)

## PAINT REFINISHING

The same lacquer preparations and painting procedures used on metal bodies are recommended for the Corvette plastic body. Realizing that most painters have their own special extras, it is felt a recommended step-by-step procedure be published in the event of questions concerning the recommended lacquer procedure. Since the standard exterior finish is a light color, Polo White, when refinishing a panel, it seems advisable to refinish to the nearest break line, although suitable spot repairs may sometimes be made. This is the same recommendation made for refinishing Metallic-Chrome Lacquered panels.

The following list comprises the Corvette paints released for field service:

"Duco" Stock No.	"Duco" Code	Color	Comb. No.
1783-H	246-57758-H	Polo White	527
1690-H	246-57587-H	Sportsman Red	
—	250-81633	Duco flattening compound	
—	246-412	Flat Black	

All exterior surfaces and the lower instrument panel, are finished with top coats of non-staining Polo White. The upper instrument panel, garnish moldings, truck compartment and top compartment are finished in semi-gloss Sportsman Red. The steering column mast jacket and steel wheels are finished in gloss Sportsman Red. Flat Black lacquer is used for the finish in the engine compartment. The under portions of the fenders are finished with Dark Gray "Preparakote" followed by a coating of Deadener. Where semi-gloss Sportsman Red is desired, Flattening compound, #250-81633, is added to the gloss Sportsman Red, Duco #246-57587-H.

The following paint procedure is recommended for panel or complete paint refinishing of the plastic Corvette body.

*NOTE: When it is desired, small pits in the plastic may be filled before primer-surfacer is applied to the plastic. After sanding area and wiping it clean, knife out imperfections with a thin coat of Dupont gray "Dulux Putty" #21-505. This is an oil type putty and requires approximately two hours to dry. The drying operation may be speeded up by the use of infra-red lamps. Even with infra-red lamps the drying time will be longer on plastic due to the fact that the plastic heat absorption rate is much slower than metal.*

1. Wipe the entire work area with a clean cloth soaked with Prep-Sol, this will remove all traces of wax, polish and grease, then wipe surface dry with a clean cloth.
2. Remove old paint finish with either Dupont Lacquer Solvent #39012, its equivalent, or by sanding with coarse sandpaper.
3. Feathersand edges of paint with #220 wet or dry sandpaper and finish feathersanding with #400 wet or dry paper.

NOTE: *For the best results, feathersand from the outside of the paint break toward the center, this will eliminate the possibility of low spots in the paint.*

4. Clean up job with Prep-Sol, then finish the cleanup with a tack rag.

CAUTION: *Avoid touching the job from this point on with bare hands, as the skin oil deposited on the surface of the panel might affect the adhesion of the paint to the body.*

5. Spray the bare plastic and feathered areas with Duco Primer-Surfacer or its equivalent, reduced 1 part Duco Primer Surfacer to 2 parts Duco Thinner. Apply two or more medium coats, allowing each to "Flash" (become dull) before applying the succeeding coat.
6. Allow the final coat to dry at least one hour before starting sanding operations.
7. For best sanding results, water sand with #320 wet or dry sandpaper. If dry sanding is preferred, use #360 paper.
8. Should pin point imperfections still show, knife out with PX putty and allow to dry for one to two hours. Sand the putty-glaze.

NOTE: *Most glazing putty failures are the result of two common errors on the operators part. First, not enough drying time is allowed for the glazing putty, and secondly, the glazing putty is applied too heavily.*

9. Dust job off, then spray entire area to be refinished with one coat of Make-Ready Sealer or its equivalent, reduce 1 part Make-Ready to 1½ parts thinner. Allow at least thirty minutes for drying, this will give maximum sealing.
10. If necessary, scuff lightly with #400 sandpaper to remove nibs, dust off panel and tack wipe.

11. Spray Polo White (Duco #246-57758-H), which has been reduced 1 part Duco to 1½ parts Duco Thinner, in three or four wet double coats. Allow each color coat to flash before applying the succeeding coat.
12. Allow at least four hours for drying, or, if possible, overnight; then hand rub with Duco Rubbing Compound No. 2 or machine polish with Machine Compound #14 or equivalent.
13. Polish by hand or machine with Duco Liquid Polish or dry buff with "Amcors" Disc No. 5, or lambs' wool bonnet.
14. It is advisable to allow at least thirty days for the Duco Lacquer to harden before performing a waxing operation. This permits all trapped solvents to disperse before wax is applied.

### RECOMMENDED MIXING CHART

Mix the resin and catalyst in the following ratios:

	<i>Working Time</i>
20 Resin (Liquid Plastic) to 1 Catalyst . . . . .	20 Minutes
30 Resin (Liquid Plastic) to 1 Catalyst . . . . .	30 Minutes
40 Resin (Liquid Plastic) to 1 Catalyst . . . . .	45 Minutes

NOTE: *Working time is also influenced by temperature, The ideal ambient temperature is 70°-75° F. In addition, satisfactory results with the plastic mixture are not obtained where the temperature falls below 70° F.*

Depending on the size of the area to be built-up will determine the amount of resin to be used. The smallest practical batch would be 2½ tablespoons to ¼ teaspoon of catalyst, which provides an ideal jell mixture.

Suggested mixture formulas, where a working time of fifteen to twenty minutes is desired are as follows. It is preferable to mix small batches to prevent batch starting to jell before complete amount is used.

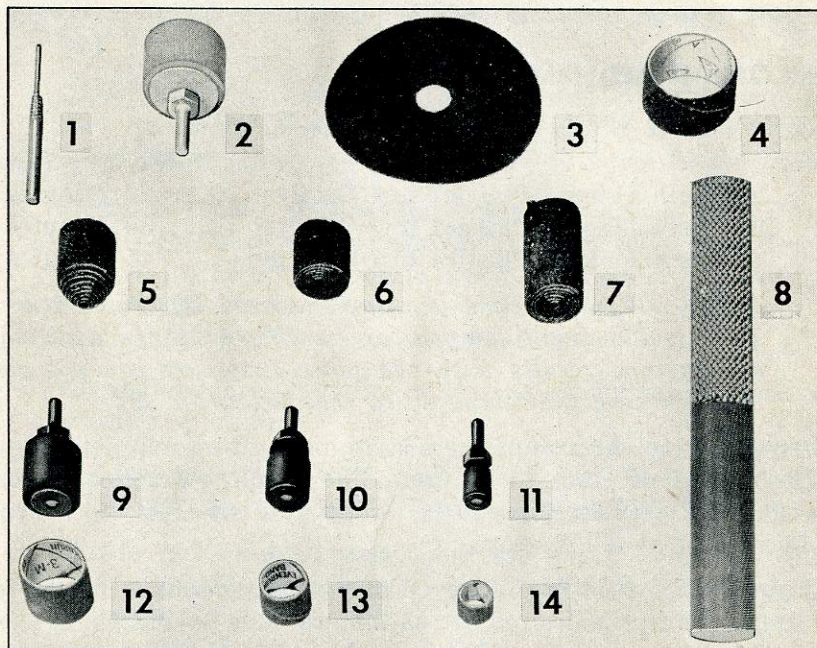
2½	Tablespoons of Resin to	¼	Teaspoon of Catalyst
4-5	Tablespoons of Resin to	¼	Teaspoon of Catalyst
8-10	Tablespoons of Resin to	½	Teaspoon of Catalyst

NOTE: *If temperatures are above 80°-85° the larger amount of resin may be used.*

### PRECAUTIONS IN WORKING WITH PLASTIC MATERIAL

1. It is suggested that a protective cream such as Protex be used on the hands.

2. Remove resin mixture from hands as soon as possible and imperatively before mixture starts to gel. This can be observed by the action of the material being used. Resin may be removed with lacquer thinner followed by washing in soap and water.
3. Respirators are recommended when grinding. Also some minor skin irritation from glass and powdered cured resin may be evident. Washing in cold water will help to minimize.
4. Resin mixtures may produce toxic fumes and should be used in well ventilated areas.
5. Be careful not to get any resin material on clothing.



**Figure 29**

1. Steel Mandril
2. Rubber Expanding Drum
3. Fiber Disc (grit 36) Silica Carbide
4. Spira Band (grit 36) Silica Carbide
5. Spira Point (grit 36) Silica Carbide
6. Speedwet Durite Cloth Pencil (grit 36) Silica Carbide
7. Speedwet Durite Cloth Pencil (grit 36) Silica Carbide
8. Cobblers File
- 9, 10, 11. Rubber Expanding Mandrils
- 12, 13, 14 Spira Bands (aluminum oxide).

**NOTE:** It has been found that Silica Carbide products last longer without excessive load up of plastic material.